

## CLAIMS

1. An artificial ear comprising: a sending unit (2) configured to convert a sound having a predetermined frequency into an electric signal and send the electric signal; and a reception unit (3) configured to receive the sent electric signal and apply it to a  
5 predetermined nerve in a cochlea, characterized in that  
said sending unit (2) includes:
  - a plurality of resonators (21b) which have resonant frequencies different from each other and vibrate with sounds having same frequencies as the resonant frequencies;
  - a conversion section (21) configured to convert vibration of each of said  
10 plurality of resonators (21b) into a signal corresponding to level of the vibration; and
  - a sending section (28) configured to send a predetermined signal among signals converted by said conversion section (21) to said reception unit (3), andsaid reception unit (3) includes:
  - a plurality of electrodes (4a) which are connected to nerves present in the  
15 cochlea and each corresponding to different frequencies from each other; and
  - a supply section (34) configured to supply a signal supplied from said sending section (28) to a predetermined electrode among said plurality of electrodes (4a) thereby stimulating a nerve corresponding to a predetermined frequency.
2. The artificial ear according to claim 1, characterized in that said sending unit  
20 (2) further includes an amplifying section (22) configured to amplify a signal converted by said conversion section (21) by a gain which varies in accordance with the respective resonant frequencies possessed by said plurality of resonators (21b).
3. The artificial ear according to claim 2, characterized in that said sending  
section (28) includes a first selection section (23) configured to select a signal to be sent  
25 to said reception unit (3) from signals amplified by said amplifying section (22).
4. The artificial ear according to claim 3, characterized in that said supply  
section (34) includes a second selection section (32) configured to select an electrode (4a)

to which a signal from said sending section (28) is to be supplied.

5. The artificial ear according to claim 4, characterized in that

said sending section (28) sends a start signal representing a start of operation by said first selection section (23) and an end signal representing an end of operation by said first selection section (23) to said reception unit (3) in order to synchronize selection operations of said first selection section (23) and second selection section (32) with each other, and

said second selection section (32) starts operating in response to the start signal and finishes operating in response to the end signal.

10 6. The artificial ear according to claim 2, characterized in that said sending unit (2) further includes a storage section (25) configured to store gains for the respective resonant frequencies possessed by said plurality of resonators (21b).